

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/000492

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> Int.Cl <sup>7</sup> E02D5/54										
According to International Patent Classification (IPC) or to both national classification and IPC										
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) Int.Cl <sup>7</sup> E02D5/54, E02D5/80										
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched <table border="0"> <tr> <td>Jitsuyo Shinan Koho</td> <td>1922-1996</td> <td>Toroku Jitsuyo Shinan Koho</td> <td>1994-2004</td> </tr> <tr> <td>Kokai Jitsuyo Shinan Koho</td> <td>1971-2004</td> <td>Jitsuyo Shinan Toroku Koho</td> <td>1996-2004</td> </tr> </table>			Jitsuyo Shinan Koho	1922-1996	Toroku Jitsuyo Shinan Koho	1994-2004	Kokai Jitsuyo Shinan Koho	1971-2004	Jitsuyo Shinan Toroku Koho	1996-2004
Jitsuyo Shinan Koho	1922-1996	Toroku Jitsuyo Shinan Koho	1994-2004							
Kokai Jitsuyo Shinan Koho	1971-2004	Jitsuyo Shinan Toroku Koho	1996-2004							
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)										
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>										
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.								
Y A	JP 11-323923 A (Tamohiro FUJITA), 26 November, 1999 (26.11.99), Full text; all drawings (Family: none)	1, 2, 4-10, 16, 18, 19 3, 11-15, 17								
Y	JP 2001-193061 A (Sumitomo Metal Industries, Ltd. et al.), 17 July, 2001 (17.07.01), Par. Nos. [0020] to [0021]; Fig. 1 (Family: none)	1, 2, 4, 6-9, 16								
Y	JP 2002-339357 A (Obayashi Corp.), 27 November, 2002 (27.11.02), Par. No. [0025]; Fig. 5 (Family: none)	5								
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.										
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family									
Date of the actual completion of the international search 24 March, 2004 (24.03.04)		Date of mailing of the international search report 06 April, 2004 (06.04.04)								
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer								
Facsimile No.		Telephone No.								

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 7-331653 A (Hidekazu TANAKA), 19 December, 1995 (19.12.95), Par. No. [0041]; Figs. 2 to 3 (Family: none)	10
Y	JP 59-096327 A (Kinsei Ko), 02 June, 1984 (02.06.84), Page 2, lower left column, line 8 to page 3, lower left column, line 2; Fig. 4 (Family: none)	18,19